ABSTRACT

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The purpose of this study was to explore the relationship between female softball players' feelings about their own softball skill and their actual softball skill. Specifically this study sought answers to the following questions:

1. What is the softball skill self-esteem of women in slo-pitch softball as measured by the Q-sort?

2. What is the softball skill of women in slo-pitch softball?

3. Is there a statistically significant relationship between softball skill self-esteem and softball skill?

4. Is there a significant difference between pre-season softball skill self-esteem and post season softball skill self-esteem?

5. Is there a difference between softball skill self-esteem of beginners and that of experienced players?

6. Does a difference exist between the softball skill self-esteem of infielders and that of outfielders?

The subjects were fifty three (53) female softball players within the Amateur Softball Association's slo-pitch, double A league in the State of Rhode Island. All subjects participated in a pre-season and post season Q-sort which was the test used to measure softball skill self-esteem.

Softball skill records, which consisted of seasonal batting and fielding averages, were kept on every active player throughout the

1975 summer season. Softball skill was defined as being equal to the composite of seasonal batting and season fielding averages.

The following conclusions were made after the analysis of data was performed using a Spearman Rho and t-tests for significant differences:

1. There is a low positive relationship between softball skill self-esteem and softball skill as measured by batting and fielding averages.

2. No significant difference existed between the pre-season and post season softball skill self-esteem Q-sorts which indicated that no significant change in softball skill self-esteem occurred over the season of play.

3. There is a significant difference between the softball skill self-esteem of beginners and that of experienced players at the .01 level of significance, indicating that experienced players report greater feelings of adequacy about their skill.

4. No significant difference was evident between softball skill self-esteem of infielders and that of outfielders indicating that infielders' softball skill self-esteem and outfielders' softball skill self-esteem may, in fact, not be related to the focus of play.

THE RELATIONSHIP BETWEEN SOFTBALL SKILL SELF-ESTEEM AND SOFTBALL SKILL

by

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Approved by

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APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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CHAPTER 1

INTRODUCTION

Human beings grow and develop in all aspects of life including the physical, psychological, social and emotional phases. Through experiences with nature, the environment, and with other humans, man builds a knowledge of his capabilities and his shortcomings. That knowledge of one's achievements and abilities or one's failures and shortcomings constitutes one's self-concept.

Self-concept then, consists of a vast array of events, experiences, emotions, perceptions, views, and attitudes. This multifaceted concept subdivides into many closely related self units a few of which are self-regard, self perception, self-actualization, self-esteem, self confidence, self-worth, and self-efficacy. This study was primarily concerned with one of those self related units namely self-esteem or one's feelings and attitudes about the adequacy of one's self in interacting with others and the environment.

Throughout the literature self-concept has received much attention in relation to learning theory and academic achievement. Some studies have compared it to various aspects of movement and body image. In a study by Goldstein (1970), self-concept was related to movement in the performance of selected jumping tasks. Other investigators have studied the cause-effect relationship of certain variables upon one's self-concept. One example of a cause-effect

study was that completed by Hurley (1971) who investigated the effects that basic swimming instruction had upon an individual's self-concept. Meiser investigated the change that might occur in self perception from the beginning to the end of a season of field hockey. Her findings showed that "competing for a position on the hockey team and playing for the team produced changes in one's self perception, yet the amount of participation did not determine the degree of change" (Meiser, 1971).

Self-concept and sport or athletic related studies are available, however, they are not abundant. Studies concerning self-esteem and sports participation or athletic performance are nearly non-existent. No studies could be found which correlated self-esteem to softball skill and more specifically softball skill self-esteem to softball skill.

Statement of the Problem

The purpose of this study was to explore the relationship between female softball players' feelings about their own softball skill and their actual softball skill. Specifically this study sought answers to the following questions:

1. What is the softball skill self-esteem of women in slo-pitch softball as measured by the Q-sort?

2. What is the softball skill of women in slo-pitch softball?

3. Is there a statistically significant relationship between softball skill self-esteem and softball skill?

4. Is there a significant difference between pre-season softball skill self-esteem and post season softball skill self-esteem?

5. Is there a difference between softball skill self-esteem of beginners and that of experienced players?

6. Does a difference exist between the softball skill self-esteem of infielders and that of outfielders?

Definition of Terms

A. S. A. Amateur Softball Association

Base hit. A cleanly hit ball which a fielder has no chance of fielding.

Batting average. This average is the percentage calculated by dividing the total number of base hits by the number of times at bat.

Beginner. Any player who has had no more than two (2) years of experience in an A. S. A. fast or slo-pitch league.

Error. A mistake in fielding or throwing the ball.

Experienced player. Any player possessing a minimum of three (3) years of experience in an A. S. A. fast or slo-pitch league.

Fielding average. This average is the percentage calculated by dividing the total number of cleanly fielded and thrown balls by the number of balls fielded and thrown.

Self-concept. An organized configuration of perceptions of the self which are admissible to awareness. It is composed of such elements as the perceptions of one's characteristics and abilities; the percepts and concepts of the self in relation to others and the environment; the value qualities which are perceived as associated with experiences and objects; and the goals and ideals which are perceived as having positive or negative valence (Rogers, 1951).

Self-esteem. One's feelings and attitudes about the adequacy of one's self in interacting with others and the environment.

Softball season. The season refers to that period of time beginning with April of 1975 and ending in July of 1975.

Softball skill. The sum total of fielding and batting averages.

Softball skill self-esteem. One's projected feelings and attitudes of adequacy in reference to one's softball skill. As a computation, it is the resultant average of the pre-season and post season Q-sort scores.

Assumptions

It was assumed in this study that: (a) the randomly selected subjects were representative of other players in the same league in the State of Rhode Island, (b) the Q-sort technique was a valid and reliable means of measuring softball skill self-esteem, and (c) the sum total of batting and fielding averages was a valid and reliable indication of softball skill.

Scope of the Study

This study was concerned with fifty-three (53) randomly selected female, slo-pitch, softball players within the Amateur Softball Association open league in the State of Rhode Island. Records of skills covered only the 1975 summer season. Self-esteem was measured by the players' responses to pre-season and post season Q-sorts administered to each participant as follows: (a) a sort for real self softball skill and ideal self softball skill during the pre-season period, and (b) a second sort for real self softball skill

and ideal self softball skill during the post season. A total of four (4) sorts were completed by each participant.

The data analysis determined only relationships and differences between softball skill self-esteem and other softball related variables such as position played and player experience. Softball skill self-esteem was determined by finding the differences between the real self sort and the ideal self sort for the pre-season test and a repeat of that procedure for the post season test. The final pre-season self-esteem score was then averaged with the final post season self-esteem score and it was this score that was used in further statistical analyses.

The limitations of this study are that (a) only fifty-three (53) female, slow-pitch, softball players from the State of Rhode Island contributed data toward the results of this study, (b) softball skill was assessed only through batting and fielding averages, and (c) softball skill self-esteem was limited to measurement by the Q-sort.

Significance of the Study

Research concerning self-esteem is scarce while that related to self-concept is quite abundant. Little attention has been focused on self-esteem as compared to self-concept, however, its importance has been acknowledged by some researchers. Branden (1971) points out the importance of self-esteem in the development of the total being. "Since a man's self-concept is crucially important to his choice of values and goals, the degree of his self-esteem (or lack of it) has a profound impact on every key aspect of his life."

Branden also mentions two (2) basic correlates of self-esteem, the first being a sense of personal efficacy and the second being a sense of personal worth (1971).

As with self-concept, all aspects of life influence one's self-esteem. Not only do the psychological, emotional and social aspects of life contribute to one's self-esteem but the physical aspect also becomes a dominant factor affecting one's self-esteem. Certainly after experiencing triumph or failure at a physical skill, whether job related or in a game situation, one's feelings and attitudes about the performance of that skill are altered. Therefore, one's physical attributes should be considered when assessing self-esteem.

Women's sporting events currently are being considered as a source which might positively influence the development of self-esteem through active participation. Rector (1972) investigated how the female athlete projects herself in a social setting and then in a competitive setting. Meiser (1971) investigated the occurrence of female field hockey player's self perception from pre-season to post season competition. Doudlah (1962) determined the relationship between the self-concept, body image and the movement concept among college women of varying motor abilities.

Most of the studies related to self-concept have been concerned with general sports participation. Few if any, have been concerned with softball, specifically women's slo-pitch softball. Fewer still have considered the participants' feelings and attitudes about her skills in relation to her actual skill.

The results of this investigation will not permit inferences about the cause and effect, however, the information about self-esteem and playing ability will add to the literature pertaining to women and competitive sports. The findings also may be of assistance to coaches of women in softball, and possibly other sports, as they apply one aspect of the affective domain to a specific sport related skill.

CHAPTER II

REVIEW OF RELATED LITERATURE

Literature concerned with the construct of self is becoming more and more abundant with time. Researchers are delving into the meaning, worth and importance of the self-concept and its components. For the most part, past self related literature was concerned with either the measurement of the concept or with theories as to what it was thought to be. Beyond this literature a good number of studies can now be found which correlate self-concept with such variables as behavior modification principles, academic achievement, and learning theories. Several investigators have linked self-concept to various motor skills or athletic performance. Only a few researchers have worked with the components of self-concept, specifically self-esteem, and tried to find relationships with various mental, social, or physical skills or abilities.

Literature directly related to this study is nearly non-existent. Few, if any, investigators have looked at self-esteem in relation to sport skills and performance. There is no evidence of any investigations which correlate a player's actual skill to that same player's feelings of adequacy about his skill.

Further, the investigators use a variety of testing instruments which does not help in the analyzing of results. Literature pertaining to the various instruments, their reliability and validity, is abundant; however, it is open to interpretation and subject to opinion.

First in this chapter will be a brief summary of the literature concerned with self-concept. Self-esteem literature will be presented second followed by a brief compilation of studies and works pertinent to this study. The Q-sorting instrument, the one chosen for this study, will be viewed only through its use in the studies presented in this chapter.

Self Concept

Literature concerned with self-concept is located primarily within the psychological disciplines. Many theorists and psychologists have proposed lengthy theories and definitions as to what the construct of self is, and how it comes to be. Basically two broad interpretations of self appear in the self related literature. The first interpretation refers to the self as the subject or agent while the second interpretation refers to the self as the individual who is known to himself (English & English, 1958).

In psychological terms the subject or agent interpretation falls under the nonphenomenological construct of self which refers mainly to the attitudes, knowledge, motivations, and perceptions, i.e., the unconscious aspects of self (Wylie, 1961). The knowledge of self interpretation is classified under the phenomenological construct of self which refers to the self as the individual who is known to himself or, as Wylie (1961) states it, "knowledge of subject's conscious perceptions of his environment, and of his self as he sees it in relation to the environment . . . the study of direct awareness" (p. 6).

A great deal of support to the phenomenological construct of self is evident in the vast number of studies related to the conscious aspect of self study. Such theorists and researchers as Goldstein, Angyal, Mead, Cooley, Lecky, and Combs and Snygg have all added knowledge and insight to current self theory, but among them the name of Carl Rogers stands out. Rogers (1951) sees the construct of self as:

> An organized configuration of perceptions of the self which are admissable to awareness. It is composed of such elements as the perceptions of one's characteristics and abilities; the precepts and concepts of the self in relation to others and to the environment; the value qualities which are perceived as associated with experiences and objects; and the goals and ideals which are perceived as having positive or negative valence (p. 501).

Rogers' definition of self is the one that will be used for the purposes of this study.

Self-Esteem

Within the first line of Rogers' definition are the words "perception of the self" referring to the component of self-concept namely self-perception. Self-concept subdivides into many components including self-regard, self-worth, self-confidence, self-actualization, self-acceptance, self-esteem and many others. Here one becomes aware of a major problem involved in phenomenological self study: an abundance of ambiguous and inadequately defined terms (Wylie, 1961, p. 6). Throughout the self-esteem literature one finds several terms being interchanged and used to mean the same thing when in reality each possesses a separate and individual meaning. Few authorities have agreed on exact definitions for these and similar words.

Of particular interest to this study is the concept of self-esteem. Branden (1971) explains self-esteem as having two (2) interrelated aspects "the first being a sense of personal efficacy and the second being a sense of personal worth" (p. 87). Barksdale (1972) describes self-esteem simply as "how one actually feels about himself, based on his individual sense of personal worth and importance" (p. 4). Gergen (1971) defines esteem as "the extent to which a person feels positive about himself" (p. 11). According to Wells and Marwell (1976), two (2) main underlying processes are present throughout the self-esteem definitions. The first is of a cognitive nature in which self evaluation takes place. The second process is self-affection and it is of the affective domain (pp. 62 & 63). It is apparent throughout the definitions that some form of evaluative judgment does take place and as a result a feeling or affection for one's self is established.

Aside from the definitions, the literature does produce two (2) outstanding themes. The first theme is that the need for self-esteem and obtaining the esteem of others is basic to all humans. Rogers (1959) points out that in some clinical cases seeking the esteem of others seems more powerful a motive than physiological needs. The second major theme is that without adequate self-esteem one functions far below his emotional, social, psychological, and intellectual potentials. This idea is evident in the following two (2) quotes:

> Since self-esteem is a basic psychological need, the failure to achieve it leads to disastrous consequences (Branden, 1971).

> To feel esteem for self is akin to one's most basic experience of well being . . . to be without esteem is symbolic of one's basic anguish in an unpredictable and uncontrollable world (Gergen, 1971).

These statements lend credence to the observation that more research is needed to investigate and understand more fully this concept of self-esteem which is innate to all humans.

Q-Technique Strategies for the Study of Self-Esteem

A second major problem in phenomenological self study is that of obtaining valid and reliable measures of the phenomenological self and its components (Wylie, 1961, p. 8). Tests such as the Adjective Check List, the Tennessee Self-Concept Scale, the Perception Check List, Q-sorts, Coopersmith's Self-Esteem Inventory, rating scales, projective tests, and questionnaires have been used as indices of measurement of self. There is no one test that has been proven the best, each one has both positive and negative qualities.

Many studies of self-concept have employed the Q-sort as a means of measurement. One of the first studies was conducted by Butler and Haigh in 1954 in which the Q-sort was developed for Client Centered Counseling purposes. Butler and Haigh's study served as a basis for many of the Q-sort studies of today. Since Butler and Haigh's study in 1954, a number of closely related studies have been conducted which have some bearing on the present study.

In 1962, Doudlah completed one of the first Q-sort studies of motor performance. Doudlah's topic was concerned with finding a relationship between self-concept, the body image, and movement-concept. A significant relationship was found between motor ability and movement concept.

A follow up to Doudlah's study was conducted by Nelson who sought a relationship between the real self-concept, ideal self-concept and motor ability of eighth grade girls in physical education (1965). Nelson's findings showed a lack of support for the assumption that self-concept differences existed among the three (3) motor ability groups after completing a unit in basketball. A statistical trend indicated, however, that students in the high and average motor ability groups did increase in awareness of self-concept following the basketball unit.

Plummer (1969) explored the achievement motivation of selected athletes through Q-sort measurement. Plummer set two (2) hypotheses in his study.

1. Athletes who participate in gymnastics have different achievement motivation in terms of social responses than those who engage in baseball.

2. Those individuals who participate in gymnastics are more highly motivated in terms of achievement than are those individuals who participate in baseball (p. 52). Both hypotheses were rejected.

Strategies for the Study of Self-Esteem Using Other Forms of Instrumentation

Goldstein (1970) employed the Perception Check List as a means of measurement in her study entitled Self-Concept of Movement in the Performance of Selected Jumping Tasks. Goldstein concluded that:

> one's expressed concept of self in relation to selected jumping tasks, is not a function of the absence or presence of required force production. Similar self-concepts will be observed in reaction to both tasks requiring force production and tasks requiring minimal force production (p. 37).

Another study within this category was conducted by Hurley (1971) and it was concerned with the effects of basic swimming instruction upon one's self-concept. Hurley used the Tennessee Self-Concept Scale to secure her self-concept data. The study showed that "those subjects with a high initial self-concept score did not achieve a higher score on the final level of basic swimming skills than those subjects with a low initial self-concept score." In conclusion Hurley found that there was no change in the total self-concept score as a result of the swimming instruction.

Meiser (1971) conducted a study concerning the self perception of female field hockey players from pre-season to post season competition. Meiser drew four (4) conclusions as a result of her work.

1. Competing for a position on the hockey team and playing for a hockey team at competitive levels are experiences which will produce changes in one's perception (p. 62).

2. One's self perception is important in determining his ultimate status in the competitive situation (p. 62).

3. It can be concluded that playing competitive field hockey did not produce positive changes in self perception since all three groups evidenced positive change (p. 62).

4. The amount of actual participation in hockey competition is not a determinant in relation to the degree of positive change in self perception (p. 62).

In a study involving the self perception of female athletes in social and competitive situations (Rector, 1972) it was found that:

1. On the basis of the data obtained from the 14 ACL scales that women athletes describe themselves to be different in social as compared to competitive situations (p. 46).

2. Women athletes participating in various individual sports describe themselves similarly in social and competitive situations when categorized and compared according to their sport (p. 46).

3. The length and type of athletic experience that the female athlete has had makes a difference in the way she describes herself as a competitor (p. 46).

Only one study could be found that correlated self-esteem with participation in athletics even though that participation was not of a performance nature. The study was conducted by Bousek (1974) and was entitled Women Intercollegiate Athletes and Self-Esteem. Bousek's study involved over 100 team sport and individual sport varsity athletes and over 100 non-athletes. Her conclusions were as follows:

1. In terms of total self-esteem all of the athletes, and the team sport athletes separately, appeared to have had significantly higher self-esteem than the non-athletes. The individual sport athletes attain higher self-esteem scores than the non-athletes from the standpoint of the observed difference although this difference was not statistically significant (p. 86).

2. In relation to general self-esteem, eliminating the effect of home, school and social esteem, all of the athletes, and the team sport athletes separately, also appeared significantly higher in self-esteem than the non-athletes from the standpoint of the observed difference although this difference was not statistically significant (p. 87).

3. In relation to the defensive reaction as measured by the Coopersmith Self-Esteem Inventory, the individual sport athletes appeared to have had slightly, but significantly, more defensive reactions than the team sport athletes. They also exhibited significantly greater variability in their scores. All other comparisons on the Lie Scale were non-significant (p. 87).

From the studies presented, one can see that no study could be found that exactly parallelled the ideas presented in this study. No studies could be found that correlate both self-esteem and sport performance, specifically slo-pitch softball performance. Finally, no studies could be found which specifically correlate a player's feelings of adequacy about her softball skill and her actual softball skill.

CHAPTER III

PROCEDURES

The purpose of this study was to explore the relationship between female softball players' feelings about their own softball skill and their actual softball skill. In order to proceed with this investigation it was necessary to secure certain information such as how many and who the subjects would be. Specific information about those subjects was needed and obtained through the use of a questionnaire. A testing instrument for self-esteem was established, adjusted to measure softball skill self-esteem, validated, and administered to each participant. Specific procedures were established for the collection of all necessary data.

Softball skill data for every subject was accurately collected and calculated over a three (3) month period, and methods of analyzing the data were established. This chapter presents these procedures.

Selection of the Subjects

The Rhode Island open league, selected for study, consisted of eight (8) teams. Four (4) of the eight (8) teams were selected by random draw. The players on each of the four (4) teams, totaling seventy-two (72) in all, formed the sample pool.

All of the participants were told the purpose of the study which was to explore the relationship between softball skill self-esteem and actual softball skill. The players were also told that if they agreed

to participate in the study, they would be required to take two (2) softball skill self-esteem tests, one at pre-season and one at post season, each requiring approximately one (1) hour of their time. The players were told that batting and fielding averages would be kept for each of them at every game within the season. All information would be kept confidential and players could obtain their own batting and fielding records by request. Questions were entertained and answered. Only one player of the seventy-two (72) player total decided initially not to participate in the study.

At the end of the season fifty-three (53) players remained as active participants in the study. The remaining nineteen (19) players became ineligible for one of the following reasons: (a) they originally did not agree to participate in the study, (b) they quit or failed to complete the season of play, (c) they handed in inaccurate or false data and test results, or (d) they failed to complete the necessary data or one of the tests. All in all, seventy-five (75) percent of the initial participants remained active participants at the end of the study.

Selection of the Testing Instrument

After reviewing many of the tests of self-esteem, the Q-sort as described by Stephenson (1953) was the tool selected for the purposes of this study for the following reasons:

1. A great many discriminations are made (Block, 1956).

2. All subjects make the same number of discriminations, comparison between orderings is straight forward, rapid, and without ambiguity (Block, 1956).

3. Interpretation of the test items is left to the subjects rather than placing a value on the items and imposing this on the subjects (Doudlah, 1962).

4. Q-sort methodology yields a clear measure, in the form of a correlation between the self and the ideal self (Doudlah, 1962).

5. The Q-sort is easy to administer, score and correlate (Doudlah, 1962).

6. Q-sorts allow for the efficient use of statistical and computational techniques (Plummer, 1969).

7. The correlation between the self and the ideal self of one test can be compared to the correlation between the self and ideal self of other tests.

8. The Q-sort lends itself easily to adjustments for the testing of specific types of self-concept or self-esteem such as softball skill self-esteem.

The Q-sort test has many positive qualities while the limitations are few. The test is difficult to administer to large groups of people at one time. Because the test consists of small cue cards it can also become an expense if many copies are made. A third limitation is that the test usually takes longer to complete than an equally long paper and pencil test. Finally, the test usually has to be administered indoors which is not conducive to an outdoor activity.

Validity and Reliability of the Q-sort

Little research has been completed which would provide adequate proof as to the true validity and reliability of the Q-sorting

instrument. With regard to the reliability of the instrument, Wylie (1961) states the following: "So far as the separate items are concerned, no information seems to be available on the Butler Haigh or any other Q-sorting instrument" (p. 48).

Construction and Refinement of the Q-Sort Instrument

The Q-sorting process consists first of giving the subjects a number of cards with statements on them. The subjects then separate the cards into columns along a continuum which distinguishes the statements as being "most like" or "least like" the subject according to the subject's view of herself.

Statements for this study were selected and adjusted from two (2) sources: (a) Barksdale's (1972) test of self-esteem, and (b) Doudlah's (1962) study of self-concept. Examples of adjustments can be found in Appendix A and Appendix B. Eighty (80) general statements of self-esteem and self-concept were altered to relate to softball skills and were presented to five (5) qualified judges.

Five (5) judges were selected who were adept in knowledge of self, knowledge of softball, or knowledge of both. The five (5) judges were given an instruction sheet (see Appendix C for complete derivation) with a statement of purpose, a definition of softball skill self-esteem, and a definition of softball skill. Each judge was also given a copy of the eighty (80) statements and three (3) rating sheets (see Appendix D for complete derivation). The judges were asked to rate the eighty (80) statements according to how closely each statement related to each of the following criteria:

1. The statement's relevance to the purpose of this study.
2. The statement's relevance to softball skill self-esteem.
3. The statement's relevance to softball skill.

Using the above criteria, the judges were asked to rate each statement on a five (5) to one (1) scale according to how pertinent the statement was to criterion number one (1), criterion number two (2), and criterion number three (3).

5 - very pertinent

4 - pertinent

3 - neutral

2 - vaguely related

1 - not related

Statements were accepted if at least three (3) of the five (5) judges rated the statement a four (4) or better for at least two (2) of the three (3) criteria. The results of the judges ratings of the statements can be found in Appendix L, Table A. Exactly sixty (60) statements were accepted (see Appendix E for complete derivation).

The number of statements used for a study may vary, however, the final arrangement of cards should always approximate a normal distribution. Doudlah (1962) used seventy-five (75) statements on a nine (9) point continuum while Plummer (1969) used sixty (60) statements on an eleven (11) point continuum. For this study a combination of both Doudlah's and Plummer's distributions was established. The result was a near normal distribution using sixty (60) statements on a nine (9) point continuum.

The left side of the nine (9) point continuum read "least like," the center section read "neutral," and the right side was labeled "most like" (see Appendix F for complete derivation).

The sixty (60) statements were typed on cards, shuffled, and consecutively numbered from one (1) to sixty (60) as they appeared in the pile. Twenty (20) decks of one and one half inch (1½") by three inch (3") cards were constructed.

A pilot test was then administered to five (5) female college students, adept in softball knowledge or skill, at The University of North Carolina at Greensboro. The purpose of the pilot test was to familiarize the experimenter with the administration and scoring procedures, and to allow for any changes or adjustments to be made if necessary. The pilot test ran smoothly and no adjustments were needed.

Administration of the Q-sort

The Q-sort was administered to all subjects in the Rhode Island sample as they were available for testing, once before the season began and again after the season was over. All four teams were tested during practices or after games depending on the location of the game or practice and how it lent itself to the testing situation. Materials were distributed, subjects were asked to read the instructions, questions were answered and testing began. The directions (see Appendix G for complete derivation) were modified from those used by Butler and Haigh (1954).

Scoring the Q-sort

The Q-sort test consists of two (2) separate sorts. The first sort is for the subjects' self estimate of softball skill while the second is for the subjects' ideal estimate of softball skill. Data sheets (see Appendix H for complete derivation) were constructed to accommodate the results of the self and ideal sorts.

First the "self" results were recorded from the Q-sort by using a number one (1) under the proper column in which the statement was found and next to the appropriate number of the statement. Next the "ideal" sort was recorded in the same manner except that a number two (2) was used instead of a number one (1). Figure 1 shows an abbreviated example of the procedure used in calculating a softball skill self-esteem score.

CONTINUUM

STATEMENTS	LEAST LIKE 1	2	3	4	5	NEUTRAL 6	7	MOST LIKE 8	9	D*	D^2
#1		2 (Ideal)					1 (Self)			-4	16
#2								1	2	1	1
#3							2		1	-2	4
.											
.											
.											
#60			1					2		5	25

D* = the column difference between self (1) and ideal (2)

Figure 1

Sample Data Sheet Showing Scoring Process For an Individual Subject

In the sample in Figure 1, statement number three (3) was found under column nine (9) on the self estimate but it was under column seven (7) on the ideal estimate. A one (1) was placed under column nine (9) next to statement number three (3) for the self estimate, while a two (2) was placed under column seven (7) next to statement number three (3) for the ideal estimate. The self estimate column = 9, was then subtracted from the ideal estimate column = 7, accounting for the -2 under D across from statement number three (3). The differences found within the D column were then squared to get the figures under D^2. The D^2 column for all sixty (60) statements was then totaled resulting in a ΣD^2 figure which is equal to that individual's softball self-esteem score for that testing session. The ΣD^2 pre-season and the ΣD^2 post season for each individual were then averaged giving a $\bar{X}\Sigma D^2$ figure which was the score used for further statistical analyses, hereby referred to as softball skill self-esteem.

Collection of the Data

Softball data. Softball skill was assessed through batting and fielding averages. In order to obtain accurate accounts of game events, softball skill sheets (see Appendix I for complete derivation) were constructed on which all necessary batting and fielding information could be recorded and tallied.

Game schedules were not always arranged to the author's advantage; therefore, four (4) attendants were trained to assist in the recording of game events. In most cases two (2) recorders were needed at each game, particularly if both of the teams playing were also

participants in this study. Recorders were required to record every event of the game in the appropriate box on the skill sheet next to the name of the player(s) who performed in the event. At the end of each game the recorders' marks were tallied and seasonal batting and fielding averages were calculated for every player.

Q-sort data. Two (2) sets of Q-sorts, one (1) pre-season and one (1) post season were completed by every active participant in this study. The Q-sort tests were administered in a large field house ajoining one of the fields of play. Subjects were asked to arrive at the field one (1) hour prior to their scheduled time of arrival in order that they could take the test and not be hurried. Those subjects who did not cooperate in this way, took the test at their own convenience when the circumstances allowed for it.

Subjects were allowed as much time as they wanted to complete the test. Once the subjects had finished, the results were recorded onto their data sheets and then collected by the recorders. Final softball skill self-esteem scores were computed and then transferred onto master data sheets (see Appendix J for complete derivation). The process was repeated for the post season testing session.

Personal data sheet. Each subject was asked to fill out a personal data sheet (see Appendix K for complete derivation) prior to the first league game. These sheets supplied information as to the experience of the player, their position on the team, the name of the team for which they played, and their addresses and phone numbers for emergencies. This information was needed for the analyses of questions

five (5) and six (6) which correlate softball skill self-esteem with the experience of the player and with player position.

Analysis of the Data

Basically two (2) forms of statistics, rank order correlation Rho and t-tests, were used in the analysis of the data.

1. What is the softball skill self-esteem of women in slo-pitch softball as measured by the Q-sort?

Data collected to answer question number one (1) consisted of the ΣD^2 scores for the pre-season and post season Q-sorts for each individual. The mean score of the pre-season ΣD^2 and the post season $\Sigma D^2 = \bar{X}\Sigma D^2$ for each individual was the score used for further statistical analyses also referred to as softball skill self-esteem.

2. What is the softball skill of women in slo-pitch softball?

The second question involved the player's actual softball skill. The standard Amateur Softball Association (hereby referred to as A. S. A.) measures for batting and fielding averages were used with the exception that errors were more specifically defined as compared to the A. S. A. definition. A player was charged with an error if she (a) could have fielded a ball but made no attempt, (b) attempts to field a ball but faults, (c) completely misjudges a ball that by all other means should have been caught, (d) makes a bad throw while attempting to put out a player, (e) fails to catch a well thrown ball, and (f) bobbles a thrown or hit ball allowing a runner(s) to advance.

Batting average is the percentage calculated by dividing the total number of base hits by the number of times at bat. Fielding

average is the percentage calculated by dividing the total number of cleanly fielded and thrown balls by the number of balls fielded and thrown. Softball skill is equal to the composite of batting and fielding averages for the season of play.

3. Is there a statistically significant relationship between softball skill self-esteem and softball skill?

The primary question, number three (3), was analyzed through the use of Rho (see Appendix M, Figure 1 for complete derivation) because Rho allows for the ranking of data and the elimination of negative coefficients which were a possibility due to the ascending and descending score values of softball skill and softball skill self-esteem respectively.

4. Is there a difference between pre-season softball skill self-esteem and post season softball skill self-esteem?

Analysis of question number four (4) was completed through the use of a t-test for large groups of correlated data. The ξD^2 values for pre-season softball skill self-esteem were compared with the ξD^2 values for post season softball skill self-esteem.

5. Is there a difference between softball skill self-esteem of beginners and that of experienced players?

6. Does a difference exist between the softball skill self-esteem of infielders and that of outfielders?

Analyses of questions numbered five (5) and six (6) were completed through the use of a t-test for small uncorrelated groups of data (see Appendix M, Figures 2, 3, and 4 for complete derivations).

CHAPTER IV

DATA AND ANALYSIS

The major concern of this study was to investigate the relationship between softball skill self-esteem and softball skill. Before this relationship could be explored softball skill self-esteem scores and softball skill results had to be obtained and analyzed. Questions one (1) and two (2) of the statement of the problem were directly concerned with this preliminary data.

1. What is the softball skill self-esteem of women in slo-pitch softball as measured by Q-sort?

Softball skill self-esteem scores used in analyses were obtained as a result of averaging the pre-season ΣD^2 and post season ΣD^2 Q-sort scores for each individual (see Appendix L, Table B for complete derivation). Total scores of softball skill self-esteem derived from the mean of the pre and post season Q-sort scores ranged from a high of 70.5 to a low of 382.5 with the mean of all scores falling at 186.3. High softball skill self-esteem was represented by a low score on the Q-sorts.

Softball skill self-esteem scores were not indicative of a particular degree of skill or of a type of performance. On Table 1, the "maximum" softball skill self-esteem score identified the subject with the least discrepancy between self and ideal self estimates. The "minimum" score identified the subject with the greatest discrepancy between self and ideal self estimates. An underlying assumption was

that players who were more highly skilled would be identified by smaller discrepancy scores on the Q-sort while the less skilled players would show greater discrepancy scores on the Q-sort.

TABLE 1

Pertinent Computations of Relationships between Softball Skill Self-Esteem and Other Related Variables

		VARIABLES				
		Beginners	Experienced	Infield	Outfield	Total
PRE SEASON	Maximum	68.00	80.00	68.00	73.00	68.00
	Minimum	446.00	370.00	446.00	397.00	446.00
	$\bar{X}$	216.41	169.67	190.88	170.43	182.80
	σ	112.28	76.91	93.51	89.63	87.74
	N	17.00	36.00	32.00	21.00	53.00
POST SEASON	Maximum	70.00	69.00	69.00	88.00	69.00
	Minimum	386.00	404.00	404.00	386.00	404.00
	$\bar{X}$	237.82	170.00	194.59	182.67	189.90
	σ	90.63	68.91	96.78	69.56	82.13
	N	17.00	36.00	32.00	21.00	53.00
SSSE	Maximum	70.50	79.50	70.50	80.50	70.50
	Minimum	382.50	332.00	382.50	327.00	382.50
	$\bar{X}$	227.06	167.04	192.69	176.57	186.30
	σ	90.13	60.05	79.53	70.12	75.60
	N	17.00	36.00	32.00	21.00	53.00

*SSS-E = Softball Skill Self-Esteem
*Maximum refers to smallest discrepancies between self and ideal self estimates
*Minimum refers to greatest discrepancies between self and ideal self estimates

Table 1 shows a break down of softball skill self-esteem into pre-season and post season data presented according to pertinent variables. Range of scores, mean scores, standard deviation, and the number of subjects concerned with each variable can also be obtained through reviewing of Table 1 (p. 29).

2. What is the softball skill of women in slo-pitch softball?

Results of seasonal batting and fielding averages appear in Appendix L, Table C. Batting average was defined as the percentage calculated by dividing the total number of base hits by the number of times at bat. Batting averages ranged from 0 to .458 with a mean average of .240.

Fielding average was defined as the percentage calculated by dividing the total number of cleanly fielded and thrown balls by the number of balls fielded and thrown. The seasonal fielding averages ranged from a perfect 1.0 to .643. The mean fielding average was .885.

This method of assessing fielding average was not the most comprehensive assessment of fielding skills. By using this method some players who played in only a few games, or players who received only a minimal number of plays on the ball because of position or lack of play, were receiving higher fielding averages than players who were obvious starters and who were involved in a greater number of plays. Fielding average is proportional to the number of events well executed to the total number of events executed. However, it did not seem fair, to total skill assessment, that a player who entered the game in the fifth (5th) inning and made one (1) good play on the ball should receive a perfect 1.0 fielding average while a player who started the

game and made twenty (20) plays on the ball, three (3) of which were errors, received an .850 fielding average. While this purely mathematical technique of taking game statistics is conventional practice in softball, it fails to account for the value of good plays by fielders. To solve these problems, perhaps a standard could be set requiring a minimum number of plays on the ball to be made before an individual's fielding average could be accepted and some strategy devised to account for plays well executed.

Softball skill was taken as the composite score resulting from adding the seasonal batting and fielding averages. The scores ranged from .750 to 1.419 with a mean score of 1.123. Table 2 shows a break down of softball skill into batting and fielding averages presented according to other relevant variables. Range of scores, mean scores, standard deviations, and number of subjects for each variable concerned with softball skill can be obtained in Table 2.

By studying the range of fielding averages, as opposed to the range of batting averages, one can see a discrepancy between the two sets of averages. It appears that a high batting average is much more difficult to achieve than a high fielding average. With this in mind, perhaps batting average alone might be a better evaluation of one's softball skill. Or, more appropriately, batting average could account for some part say, two-thirds (2/3), of softball skill while fielding average could account for only one-third (1/3) of softball skill. A weighting of the elements of softball skills in this manner might provide for a more accurate evaluation of a player's softball skill.

TABLE 2

Softball Skill and Related Variable Computations

V A R I A B L E S

		Beginners	Experienced	Infield	Outfield	Total
BATTING	High	.331	.458	.345	.458	.458
	Low	.097	.114	0.000	.139	0.000
	$\bar{X}$	.189	.263	.223	.264	.240
		.075	.078	.081	.105	.084
	N	17.000	36.000	32.000	21.000	53.000
FIELDING	High	1.000	1.000	1.000	1.000	1.000
	Low	.643	.750	.750	.643	.643
	$\bar{X}$	.861	.896	.840	.905	.885
		.098	.068	.246	.086	.072
	N	17.000	36.000	32.000	21.000	53.000
SS	High	1.1281	1.419	1.315	1.419	1.419
	Low	.750	.892	.750	.832	.750
	$\bar{X}$	1.047	1.160	1.093	1.170	1.123
		.145	.105	.125	.123	.129
	N	17.000	36.000	32.000	21.000	53.000

*SS = Softball Skill

3. Is there a statistically significant relationship between softball skill self-esteem and softball skill?

The primary problem, question number three (3), was analyzed through the use of a Spearman Rho Correlation because the Q-sort yeilds ordinal data (see Appendix M, Figure 1 for complete derivation).

The data concerned with questions one (1) and two (2) were put into tabular form (see Appendix L, Table D for complete derivation) and computed to supply the ΣD^2 figures necessary for the computation of Rho. The final ΣD^2 score was then inserted into the Rho formula the result of which was a correlation of Rho = +.25 revealing a low, positive relationship between softball skill self-esteem and softball skill.

This .25 correlation was then analyzed further for interpretation of the Spearman Correlation Coefficient. The computation of probability value by computer analysis gave a result showing a .034 level of significance. The result indicated that approximately three (3) out of every one hundred (100) cases could be due to random chance.

The investigator believed that a higher correlation should have resulted in relating softball skill self-esteem to softball skill even though no substantial evidence could be found to support this feeling. The low positive correlation could have resulted from one of the following reasons: (1) The questionable assessment of softball skill resulted in high fielding averages for players who did not necessarily deserve them and could have affected the relationship. (2) The random drawing process used yielded a sample of teams rather than individuals. Because some teams could have had more players of certain skill levels, the range of skill throughout the sample might have been lost thereby reducing the chances for systematic relationships between the ranked sets of data. The total range of softball skill covered only .669 points. This slight range of softball skill scores could have accounted for the low relationship that resulted between softball skill self-esteem and softball skill.

Question number four (4) was analyzed through the use of a t-test for large, grouped, correlated data. Table E, Appendix L shows the scores for the pre-season and post season Q-sorts for each individual. The formula and the computations of t for question four (4) can be found in Appendix M, Figure 2. The results of the analysis revealed a t = -.55 which was not significant at the .05 level of significance (see Table 3 for complete derivation). No difference existed between the pre-season and post season Q-sorts for softball skill self-esteem which implied that softball skill self-esteem did not increase or decrease over the season of play. This result also indicated that a reactive effect could have occurred between the two (2) test administrations which encompassed approximately a two (2) month time period. With only two (2) months between testing periods it was possible that players remembered their responses to the first test and reacted in some way to the second test.

TABLE 3

Results of t-tests for Correlated and Uncorrelated Data

		Correlated Data	Uncorrelated Data	
		Pre-Season Post Season	Infield Outfield	Beginner Experienced
STATISTICAL	t	- .55	.75	2.814
	p*	.05	.05	.01
	CR*	2.000	2.000	2.660
	df*	52.0	52.0	52.0

*P = Level of Significance *CR = Critical Ratio *df = Degrees of Freedom

Another possibility for the lack of a significant difference from pre to post season was that not enough time elapsed between testing periods to allow for a significant change to occur in softball skill self-esteem since self-esteem is basically a stable characteristic among humans.

Question number five (5), concerned with the softball skill self-esteem of beginners and experienced players, was analyzed by the t-test for small uncorrelated data. Table F, Appendix L shows the scores for beginners and the scores for experienced players. The formula for small uncorrelated data along with the computations for t can be found in Appendix M, Figure 3. The results revealed a $t = 2.814$ which showed that a difference did exist between the softball skill self-esteem of beginners and that of experienced players. The difference was found to be significant at the .01 level of significance. The result indicated that experience might influence one's feelings of adequacy concerning one's skill. No inferences can be made as to whether the difference was positive toward experienced players or not. However, after comparing the mean softball skill self-esteem score for beginners (227.06) with the mean softball skill self-esteem score for experienced players (167.04) one can conclude that experience may help to create more positive feelings of adequacy concerning one's skill since a small value for softball skill self-esteem in this case indicated greater self-esteem. See tables 1 (p. 29), 2 (p. 32), and 3 (p. 34) for specific statistics concerning beginner and experienced players.

Question number six (6), which referred to the difference between the softball skill self-esteem of infielders and that of outfielders was presented in this study because it was believed that infielders, being more in the center of all plays, would have greater feelings of adequacy about their skill than outfielders who are removed from central plays. This question employed the t-test for small uncorrelated data (see Appendix M, Figure 4 for complete derivation) as the statistical measure for significant differences. Data related to this question was assembled in tabular form and is presented in Appendix L, Table G.

The results of the t-test left a t = .74 (see Table 3, p. 34 for complete derivation) which showed that no significant difference existed between the softball skill self-esteem of infielders and that of outfielders. This result indicated that infielder's softball skill self-esteem and outfielder's softball skill self-esteem may, in fact, not be related to the focus of play.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study was mainly concerned with the investigation of the relationship between softball self-esteem and softball skill. The study was conducted during the summer of 1975 in the State of Rhode Island. The subjects were fifty-three (53) female softball players within the Amateur Softball Association's slo-pitch, double A league. All subjects participated in a pre-season and post season Q-sort which was the test used to measure softball skill self-esteem. Each subject also filled out a personal data sheet which supplied information for further correlations.

Softball skill records were kept on every active player throughout the 1975 summer season. Seasonal batting and fielding averages were calculated and recorded after every game. Softball skill was defined as being equal to the composite of seasonal batting and seasonal fielding averages.

Two (2) forms of statistics were used in analyzing the data, Spearman Rho and Fisher's t-test for significant differences between group means. For the primary problem which sought a relationship between softball skill self-esteem and softball skill Rho was used to correlate the two (2) variables.

All other questions were statistically analyzed by t-tests for significant differences between the group means.

Conclusions

1. There is a low positive relationship between softball skill self-esteem and softball skill as measured by batting and fielding averages. This low relationship might have been influenced by a reactive effect due to the close spacing of Q-sort tests or unanticipated sampling bias.

2. No significant difference existed between the pre-season and post season softball skill self-esteem Q-sort results which indicated that no significant change occurred in softball skill self-esteem over the season of play.

3. There was a significant difference between the softball skill self-esteem of beginners and that of experienced players at the .01 level of significance, indicating that experienced players reported greater feelings of adequacy about their skill.

4. No significant difference was evident between softball skill self-esteem of infielders and that of outfielders indicating that greater focus of play may not be related to one's feelings of adequacy of skill.

Critique

It is suggested for future studies that certain situations be avoided in order that more helpful results be obtained. The following suggestions are offered:

1. The sample of subjects should cover a more diverse range of skill so that differences which might exist can be brought out through statistical analysis.

2. Softball skill should be assessed differently to account for the difference in the number of plays on the ball that each player receives. Perhaps a standard requirement of a minimum number of plays on the ball should be enforced or a method of accounting for superior plays or plays well executed should be incorporated into the skill assessing process.

3. A test for softball skill self-esteem which is more conducive to outdoor environments should be adopted.

4. The administration of self-esteem tests should be spread out over a greater time period, perhaps two (2) or three (3) seasons of play to eliminate the possibility of reactive effects and to allow for possible changes of self-esteem to occur.

5. Q-sort statements should be evenly divided so that an equal number of positive and negative statements are available for the subjects who are sorting.

Recommendations

The following recommendations and suggestions are offered for further study:

1. Correlations of skill self-esteem be conducted with other measurable sports such as golf, archery, basketball, bowling, and track and field.

2. The skill self-esteem of starters be compared with the skill self-esteem of non-starters.

3. Team self-esteem (the sum total of team players' self-esteem scores, possibly) be correlated with win/loss record.

4. Skill self-esteem of high school girls in a varsity sport be compared with skill self-esteem of college women participating in the same sport.

5. A longitudinal study measuring the skill self-esteem of a rank beginner to the skill self-esteem of that same person over time.

6. Investigations of the effect that sports participation has upon skill self-esteem or general self-esteem be conducted.

7. Investigations concerned with the effect that high or low self-esteem (or skill self-esteem) might have upon one's physical skill or competitive performance.

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APPENDIX A

Supplementary Materials Pertinent to Testing and Data Collection

Original Eighty Q-sort Statements Before Adjustments

1. I express my emotions freely.
2. Most of my troubles are not my own fault.
3. I feel happy much of the time.
4. I feel secure within myself.
5. It's quite important for me to know how I seem to others.
6. I often feel that I want to give up trying to cope with the world.
7. I have confidence in myself.
8. I am kept going in hopes for the future.
9. I have courage — the willingness to keep trying.
10. I am a strong, competent person.
11. I am full of life and good spirits.
12. I feel free and unhampered.
13. I can stand up for my rights if I need to.
14. My decisions are not my own. I feel controlled by others.
15. I am ashamed of myself.
16. I don't remake myself to satisfy each person who is important to me.
17. I have initiative. I can get started on my own.
18. It takes everything I've got to keep going.
19. If I can't have perfection, I don't want anything. Nothing in between will satisfy me.
20. I have confidence in myself.
21. I am fearful, often dreading what may happen.
22. My energies and abilities are fully available to me.
23. I am intelligent.
24. I have a feeling I'm just not facing things.
25. I feel I cannot place the ball while batting.
26. I am different from others.
27. I tend to feel envy at other people's good fortune.
28. I have to protect myself with excuses, with rationalizing.
29. I am satisfied with myself.
30. I am worth being loved.
31. I shrink from facing a crisis or a real hard test of myself.
32. I understand myself.
33. I have a feeling of hopelessness.
34. I often feel resentful.
35. I am a clumsy fielder; I always bobble the ball.
36. I can place the ball to any field when batting.
37. I feel inferior.
38. I am a failure.

Original Eighty Q-sort Statements Before Adjustments, continued

39. I am satisfied with myself.
40. I have little accuracy in throwing.
41. I am emotionally mature.
42. I am optimistic.
43. The term "rag arm" describes my throwing skill quite well.
44. I am pretty sociable, and really enjoy being with people.
45. I lack confidence in myself.
46. I am critical of people.
47. I am superior to most other people.
48. I get upset when old and familiar things are changed.
49. I'm a pretty calm and relaxed person. Few things really bother me.
50. I am really self-centered — don't care much about other people.
51. It is pretty hard to really be myself.
52. I am usually an aloof, reserved person.
53. I do care for others and want them to be happy.
54. I am very unsure of myself.
55. I live largely by other people's values end standards.
56. I am a submissive person.
57. I am adaptable. A strange situation is not a crisis to me.
58. I feel adequate.
59. I am a pretty stable person.
60. I am conscientious and honorable — can be depended upon.
61. I would rather sit on the bench than to play before a crowd.
62. I can run bases like the wind.
63. I usually condemn myself for my mistakes and shortcomings.
64. I have a driving need to prove my worth and excellence.
65. I can let others be "wrong" without attempting to correct them.
66. I hunger for recognition and approval.
67. I anticipate new endeavors with quiet confidence.
68. I am prone to condemn and wish to punish others.
69. I willingly take responsibility for the consequences of my actions.
70. I tend to belittle my talents, possessions and achievements.
71. I am vulnerable to others' opinions, comments and attitudes.
72. I am a compulsive "perfectionist."
73. I can never beat out a well hit ball.
74. I am often embarrassed by the actions of my family or friends.
75. I experience a strong need to defend my acts, opinions and beliefs.
76. I take disagreement without feeling "put down," or rejected.
77. I am eagerly open to new ideas and proposals.
78. I judge my self-worth by comparison with others.
79. I frequently boast about myself, my possessions and achievements.
80. I can accurately throw the ball to most any target.

APPENDIX B

Supplementary Materials Pertinent to Testing and Data Collection

Original Eighty Q-sort Statements for Softball Skill Self-Esteem

1. I express my emotions freely about game occurrences.
2. Most of my errors are not my own fault.
3. I feel happy while playing softball.
4. I feel secure in my batting skill.
5. It's quite important for me to know how others view my performance.
6. I often feel that I want to give up trying to cope with other players and the league.
7. I have confidence in my fielding skill.
8. I am kept going in hopes of greater skill acquisition in the future.
9. I have courage ... the willingness to keep trying to perfect my skill.
10. I am a strong, competent, player.
11. I am full of life and good spirits during games.
12. I feel free and unhampered while running the bases.
13. I can stand up for my rights on the team if I need to.
14. My decisions are not my own. I feel controlled by my teammates.
15. I am ashamed of my batting skill.
16. I don't remake myself to satisfy the coach or my teammates.
17. I have initiative; I can get started at practice without having to be told.
18. It takes everything I've got just to keep playing.
19. If I can't have perfection in skill, I don't want anything.
20. I have confidence in my batting skill.
21. I am fearful, often dreading what may happen during each new game.
22. My energies and abilities are fully available to me while performing.
23. I am an intelligent player. I know and use offensive and defensive strategy whenever I play.
24. I have a feeling I'm just not living up to my potential.
25. I feel I cannot place the ball while batting.
26. I am different from other players.
27. I tend to feel envy at other players being picked for the All Star Teams.
28. I have to protect my bad plays with excuses, with rationalizing.
29. I am satisfied with just hitting the ball.
30. I am worth being a part of the team.
31. I shrink from facing a crisis or a real hard test of my skill.
32. I understand my actions on the field.

Original Eighty Q-sort Statements for Softball Skill Self-Esteem,

continued

33. I have a feeling of hopelessness whenever I try out for a new softball team.
34. I often feel resentful when I have to sit on the bench.
35. I am a clumsy fielder; I always bobble the ball.
36. I can place the ball to any field when batting.
37. My skill is inferior to that of my teammates.
38. I am a failure to my coach and teammates.
39. I am satisfied with my skill.
40. I have little accuracy in throwing.
41. I am an emotionally mature player.
42. I am optimistic in facing new competition.
43. The term "rag arm" describes my throwing skill quite well.
44. I am pretty sociable, and really enjoy the softball scene.
45. I lack confidence in fielding ground balls.
46. I am critical of other players.
47. I am superior to most other players.
48. I get upset when old, familiar rules are changed.
49. I'm a pretty calm and relaxed player. Bad plays and umpire calls seldom upset me.
50. I am really self-centered; I don't care much about other players.
51. It is pretty hard to really be myself on the softball field.
52. I am usually an aloof, reserved player.
53. I do care for other players and want them to be happy.
54. I am very unsure of myself when catching fly balls.
55. I play largely by the team values and standards.
56. I am a submissive opponent.
57. I am adaptable. A strange field or opponent is not a crisis for me.
58. I feel my skill is adequate.
59. I am a pretty stable player.
60. I am conscientious and honorable -- can be depended upon by my coach and teammates.
61. I would rather sit on the bench than to play before a crowd.
62. I can run bases like the wind.
63. I usually condemn myself for my errors and mistakes.
64. I have a driving need to prove my worth and excellence on the team.
65. I cannot let others make "bad plays" without attempting to correct them.
66. I hunger for recognition and approval by the coach.
67. I anticipate new competitors with quiet confidence.
68. I am prone to condemn and wish to punish other players who make errors.
69. I willingly take responsibility for the consequences of my own actions on the field.

Original Eighty Q-sort Statements for Softball Skill Self-Esteem,

continued

70. I tend to belittle my talents, possessions and achievements in softball.
71. I am vulnerable to other's opinions, comments and attitudes about my skill and performances.
72. I am a compulsive perfectionist in playing softball.
73. I can never beat out a well hit ball.
74. I am often embarrassed by the actions of teammates.
75. I experience a strong need to defend my acts, opinions and beliefs as to how the team should be organized.
76. I take disagreement without feeling "put down," or rejected.
77. I am eagerly open to constructive criticism of my fielding or batting skill.
78. I judge the worth of my skill by comparisons with others.
79. I frequently boast about my skill and accomplishments.
80. I can accurately throw the ball to most any target.

APPENDIX C

Judges Instructions

The major purpose of this study is to investigate the relationship between softball skill self-esteem and actual softball skill of female, slow-pitch softball players.

Softball Skill Self-esteem is defined as one's projected feelings and attitudes of adequacy in reference to one's softball skill.

Softball Skill for the purposes of this study, is equal to the sum total of fielding average and batting average.

With these purposes and definitions in mind, you are asked to rate the 80 statements according to each of the following criteria:

1. The statement's relevance to the purpose of the study.
2. The statement's relationship to softball skill self-esteem.
3. The statement's relationship to softball skill.

Using the above criteria, you are asked to rate each statement on a five to one scale according to how pertinent it is to criterion 1, criterion 2 and criterion 3.

5 - very pertinent
4 - pertinent
3 - neutral
2 - vaguely related
1 - not related

With the above information in mind, you are asked to read each statement carefully and decide on it's degree of relationship first to criterion 1; then put a check mark in the appropriate degree of pertinence (5-1) column, next to the statement. Repeat this process using

Judges Instructions, continued

criterion 2 and then again using criterion 3. Statement rating sheets are provided for you; one for each criterion.

Thank you for assisting in the establishment of Q-sort statements for this study.

APPENDIX D

Statement Rating Sheet

Criteria for rating: (1) Statement's relevance to the purpose of the study, (2) Statement's relationship to softball skill self-esteem, and/or (3) Statement's relationship to softball skill.

STATEMENT NUMBERS	Very Pertinent 5	Pertinent 4	Neutral 3	Vaguely Related 2	Not Related 1	Total
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

STATEMENT NUMBERS	Very Pertinent 5	Pertinent 4	Neutral 3	Vaguely Related 2	Not Related 1	Total
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						

Statement Rating Sheet, continued

STATEMENT NUMBERS	Very Pertinent 5	Pertinent 4	Neutral 3	Vaguely Related 2	Not Related 1	Total
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
77						
78						
79						
80						

APPENDIX E

Final Sixty Q-sort Statements

1. I express my feelings freely about game occurrences.
2. Most of my errors are not my own fault.
3. I feel secure in my batting skill.
4. It's quite important for me to know how others view my performance.
5. I have confidence in my fielding skill.
6. I am kept going in hopes of greater skill acquisition in the future.
7. I have courage ... the willingness to keep trying to perfect my skill.
8. I am a strong, competent player.
9. I feel free and unhampered while running the bases.
10. My decisions are not my own. I feel controlled by my teammates.
11. I am ashamed of my batting skill.
12. I have initiative; I can get started at practice without having to be told.
13. If I can't have perfection in skill, I don't want anything.
14. I have confidence in my batting skill.
15. I am fearful, often dreading what may happen during each new game.
16. My energies and abilities are fully available to me while performing.
17. I am an intelligent player. I know and use offensive and defensive strategy whenever I play.
18. I have a feeling I'm just not living up to my potential.
19. I feel I cannot place the ball while batting.
20. I am different from other players.
21. I tend to feel envy at other players being picked for the All Star Team.
22. I have to protect my bad plays with excuses, with rationalizing.
23. I am satisfied with just hitting the ball.
24. I am worth being a part of the team.
25. I shrink from facing a crisis or a real hard test of my skill.
26. I understand my actions on the field.
27. I have a feeling of hopelessness whenever I try out for a new team.
28. I often feel resentful when I have to sit on the bench.
29. I am a clumsy fielder; I always bobble the ball.
30. I can place the ball to any field when batting.
31. My skill is inferior to that of my teammates.
32. I am a failure to my coach and teammates.
33. I am satisfied with my skill.
34. I have little accuracy in throwing.
35. I am an emotionally mature player.
36. I am optimistic in facing new competition.

Final Sixty Q-sort Statements, continued

37. The term "rag arm" describes my throwing skill quite well.
38. I lack confidence in fielding ground balls.
39. I am superior to most other players.
40. I'm a pretty calm and relaxed player. Bad plays and umpire calls seldom upset me.
41. I am very unsure of myself when catching fly balls.
42. I am a submissive opponent.
43. I am adaptable. A strange field or opponent is not a crisis for me.
44. I feel my skill is adequate.
45. I am a pretty stable player.
46. I would rather sit on the bench than play before a crowd.
47. I can run bases like the wind.
48. I usually condemn myself for my errors and mistakes.
49. I have a driving need to prove my worth and excellence on the team.
50. I anticipate new competitors with quiet confidence.
51. I willingly take responsibility for the consequences of my own actions on the field.
52. I tend to belittle my talents, possessions and achievements in softball.
53. I am vulnerable to other's opinions, comments and attitudes about my performances.
54. I am a compulsive perfectionist in playing softball.
55. I can never beat out a well hit ball.
56. I take disagreement without feeling "put down," or rejected.
57. I am eagerly open to constructive criticism of my fielding or batting skill.
58. I judge the worth of my skill by comparisons with others.
59. I frequently boast about my skill and accomplishments.
60. I can accurately throw the ball to most any target.

APPENDIX F

Continuum for Forced Distribution Q-sorting

Least Like				Neutral			Most Like	
1	2	3	4	5	6	7	8	9
X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	
	X	X	X	X	X	X	X	
	X	X	X	X	X	X	X	
		X	X	X	X	X		
		X	X	X	X	X		
			X	X	X			
			X	X	X			
			X	X	X			
				X				
				X				

APPENDIX G

Directions for Administration of Q-sort

You will find before you a set of cards and a sort aid. On each card a statement about how people think and feel about their softball skill is typed. You are asked to sort these cards according to the way they describe you as you see your own softball skill today. The task is to sort the 60 statements along a continuum; those statements you consider to be least like you are at one end and those that are most like you are placed at the other end.

If you look at the sorting aid, you will see that there is a total of 60 spaces arranged in nine columns. A specific number of spaces are provided in each column. In the extreme left column you put the two statements that describe your skill least well, that are least like you in a softball setting. In the extreme right column put the two statements that you believe describe your skill the best, that are most like you in a softball setting. In the columns in between arrange the other statements so that they increase proportionately. This is very important. Try to make the distance between the columns as even as possible; for example, the statements in the second column should, in your judgment, be more like you than the statements in the first column.

You MUST place EACH statement in one of the columns but you may only use the number of spaces allotted. Note, for instance, in column

Directions for Administration of Q-sort, continued

four there are only 10 spaces. Do not use the same number twice. There is no time limit; in fact, you are encouraged to take as much time as necessary. It is suggested that you sort the statements into 9 piles or columns first. After you have constructed the columns so that they best represent your softball skill, you will repeat the process on the other half of the aid so that the statements represent your ideal softball skill, i.e., your desired skill level or what you wish your skill most to be like.

APPENDIX H

Data Sheet

Columns

STATEMENTS	1	2	3	4	5	6	7	8	9	D	D^2
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

Columns

STATEMENTS	1	2	3	4	5	6	7	8	9	D	D^2
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											

$D^2 =$

APPENDIX I

Softball Skill Sheet

	Starting Players										Non-start			
Uniform # or name														
Position number														
Times at bat														
Base hits														
Sac. flies and walks														
Batting average														
Total # of balls fielded														
Fielding errors														
Total # of balls thrown														
Throwing errors														
Fielding average														
Softball skill score														

APPENDIX J

Master Data Sheet

Data	Players												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Infield (I) - Outfield (O)													
Beginner (B) - Experienced (E)													
Pre-season SSS-E = ΣD^2													
Post-season SSS-E = ΣD^2													
Sum of Pre & Post ΣD^2													
Mean of Pre & Post $\Sigma D^2 = \bar{X}\Sigma D^2$													
Fielding Average													
Batting Average													
Softball Skill													

APPENDIX K

Personal Data Sheet

Please complete the following information.

Name:_____

Address:_____

_____

Phone number:_____

Best time to contact you if necessary:_____

Team name:_____

Your uniform number:_____

Assigned position:_____

Other position:_____

Position most often played:_____

Are you a regular starter?_____

How many years have you played with this team?_____

Other previous softball experience:_____

_____

Total number of years of softball experience:_____

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table A

Results After Five Judges Rated Statements According to Three Criteria

	Judges															
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
	Criteria															
Statements	I					II					III					
1	1	4	5	4	3	1	2	5	5	5	1	1	2	3	1	*
2	3	4	5	4	2	4	4	5	4	5	1	4	4	4	2	*
3	1	3	2	5	4	3	3	2	3	4	1	1	2	3	1	
4	1	4	5	5	4	5	5	5	4	5	1	4	5	5	5	*
5	1	4	4	5	5	4	3	4	5	4	1	1	2	4	4	*
6	4	4	2	5	3	4	1	2	5	1	1	2	2	4	1	
7	4	4	5	4	5	4	5	5	4	5	1	3	5	5	5	*
8	4	3	4	4	4	3	3	4	4	5	4	3	5	5	5	*
9	4	3	4	4	5	2	2	4	5	5	4	3	4	5	5	*
10	3	4	5	4	5	4	4	5	4	4	1	5	5	5	5	*
11	4	4	2	3	3	4	1	2	4	2	1	1	2	4	1	
12	4	4	3	4	5	4	3	3	4	4	1	1	4	4	3	*
13	1	3	4	4	3	2	2	4	5	1	1	1	2	3	1	
14	4	4	4	4	4	4	3	4	5	2	1	1	2	3	1	*

Results After Five Judges Rated Statements According to Three Criteria, continued

	Judges															
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
	Criteria															
Statements	I					II					III					
15	5	4	5	4	5	2	5	5	4	5	5	5	5	5	5	*
16	1	3	4	4	4	2	1	4	5	4	1	1	2	3	1	
17	4	3	3	4	5	4	2	3	4	4	4	1	3	4	2	*
18	4	4	3	3	2	4	4	3	3	2	1	1	3	4	1	
19	4	3	5	5	5	4	4	5	5	5	4	3	5	5	5	*
20	4	5	5	4	4	4	5	5	4	5	1	5	5	5	5	*
21	2	4	5	5	5	2	4	5	5	5	1	1	4	4	4	*
22	4	3	5	3	4	4	4	5	3	4	1	3	5	5	3	*
23	4	4	5	4	5	4	5	5	3	5	2	5	5	5	5	*
24	5	3	5	5	5	5	2	5	5	5	2	3	4	5	4	*
25	4	4	5	3	4	1	4	5	3	5	4	5	5	5	5	*
26	4	2	4	5	3	4	1	4	5	3	1	1	2	4	1	*
27	4	4	4	5	5	4	4	5	5	5	1	1	3	5	4	*
28	4	4	5	4	4	4	4	5	5	5	4	1	4	4	2	*
29	4	3	5	4	5	4	3	5	3	5	4	4	5	5	3	*
30	4	3	5	5	2	4	3	5	5	2	2	4	5	4	2	*
31	4	4	5	5	5	4	3	5	5	5	1	2	5	5	5	*

Results After Five Judges Rated Statements According to Three Criteria, continued

Statements	Judges															
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
	Criteria															
	I					II					III					
32	4	3	4	4	4	2	3	3	4	4	1	4	4	4	2	*
33	4	4	5	4	4	4	4	5	5	4	2	3	5	4	4	*
34	4	4	3	5	4	4	4	5	5	5	2	1	3	4	4	*
35	4	4	5	4	5	4	4	5	4	5	4	5	5	5	5	*
36	4	4	5	4	5	2	4	5	4	5	4	5	5	5	5	*
37	4	4	5	4	4	2	4	5	5	4	5	5	5	5	2	*
38	4	4	5	3	2	4	4	5	3	2	4	2	4	3	5	*
39	4	4	5	4	5	4	3	5	4	4	4	5	5	5	2	*
40	4	4	5	4	4	2	4	5	4	4	4	5	5	5	5	*
41	4	4	5	4	4	4	4	5	5	2	1	2	3	3	2	*
42	4	3	5	5	4	4	4	5	5	4	2	1	4	3	4	*
43	4	4	4	3	4	4	4	4	3	4	4	5	5	5	5	*
44	4	3	2	4	1	4	1	2	4	1	1	1	2	3	2	
45	4	4	5	4	4	4	4	5	4	4	2	5	5	5	5	*
46	3	2	2	4	2	3	3	2	4	2	1	3	2	4	3	
47	4	4	5	4	4	4	5	5	5	4	4	3	5	5	4	*
48	4	3	2	2	2	3	2	2	3	2	1	4	2	3	1	

Results After Five Judges Rated Statements According to Three Criteria, continued

	Judges															
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
	Criteria															
Statements	I					II					III					
49	4	4	5	4	2	4	3	5	5	2	1	1	4	4	3	*
50	4	3	4	4	2	4	3	4	3	2	1	1	3	3	1	
51	2	4	2	3	4	2	4	2	3	4	1	1	2	3	1	
52	4	4	2	3	2	4	2	2	4	2	1	1	2	3	1	
53	4	2	2	2	2	4	1	2	4	2	1	1	2	3	1	
54	4	4	5	4	5	4	4	5	4	5	2	4	5	5	5	*
55	4	3	2	4	2	4	1	2	4	2	2	1	2	3	1	
56	3	4	5	4	2	3	4	5	4	2	2	3	5	4	1	*
57	3	4	5	4	4	3	3	5	4	3	3	3	4	5	4	*
58	4	4	5	4	5	2	4	5	4	5	4	4	5	5	5	*
59	4	4	5	4	4	3	4	5	4	4	4	4	4	5	4	*
60	4	3	3	4	2	4	1	3	5	2	4	1	2	3	1	
61	3	4	5	5	5	3	4	5	5	5	3	4	5	5	2	*
62	4	4	5	4	4	4	5	5	4	4	4	5	5	5	5	*
63	4	3	5	5	4	4	2	5	5	4	4	1	4	5	2	*
64	4	4	5	5	4	4	2	5	5	4	4	1	5	5	2	*
65	2	4	3	4	2	3	2	3	4	2	1	1	3	5	1	

Results After Five Judges Rated Statements According to Three Criteria, continued

	Judges															
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	
	Criteria															
State-ments	I					II					III					
66	3	4	4	5	2	3	3	4	5	2	3	1	3	4	1	
67	3	4	5	4	4	3	3	5	4	4	3	1	5	3	1	*
68	3	4	2	4	2	3	3	2	4	2	3	1	3	4	1	
69	4	4	5	5	2	4	3	5	5	2	4	4	5	5	1	*
70	4	4	5	4	4	4	4	5	5	4	4	2	3	4	1	*
71	4	3	5	5	4	4	2	5	5	4	4	1	4	4	1	*
72	4	4	5	4	5	4	4	5	5	4	4	2	5	5	4	*
73	4	4	5	4	5	4	4	5	4	5	2	5	5	5	5	*
74	3	3	2	3	1	3	1	2	4	1	3	1	2	3	1	
75	3	3	3	4	3	3	2	3	5	3	3	1	2	3	1	
76	4	4	4	5	2	4	2	4	2	2	3	1	2	4	1	*
77	4	4	4	5	4	4	3	4	5	4	4	1	5	5	4	*
78	4	3	5	5	4	2	3	5	5	4	4	3	5	5	2	*
79	4	4	5	4	4	4	4	5	4	4	4	1	4	5	1	*
80	4	5	5	4	5	3	5	5	4	5	4	5	5	5	5	*

* statements that were accepted by at least three judges for at least two of the three criteria

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table B

Softball Skill Self-esteem Data

Subject	Rank Order	Pre-season Score D^2	Post-season Score D^2	Total	$\bar{X}\leq D^2=$ SSS-E*
1	24	100	226	326	163
2	11	98	143	241	120.5
3	17	93	188	281	140.5
4	10	124	96	220	110
5	26	178	156	334	167
6	3	73	88	161	80.5
7	20	136	158	294	147
8	28	231	110	341	170.5
9	41	221	288	509	254.5
10	37	224	200	424	212
11	30	209	148	357	178.5
12	12	122	124	246	123
13	7	89	128	217	108.5
14	38	228	208	436	218
15	46	188	360	548	274
16	8	115	103	218	109

Softball Skill Self-esteem Data, continued

Subject	Rank Order	Pre-season Score D^2	Post-season Score D^2	Total	$\bar{X}\leq D^2 =$ SSS-E*
17	44	312	222	534	267
18	32	188	174	362	181
19	39	138	302	440	220
20	35	171	239	410	205
21	4	68	98	166	83
22	25	129	199	328	164
23	1	71	70	141	70.5
24	21	140	156	296	148
25	2	90	69	159	79.5
26	48	242	366	608	304
27	49	274	336	610	305
28	45	140	404	544	272
29	6	80	132	212	106
30	51	361	303	664	332
31	50	264	386	650	325
32	23	186	138	324	162
33	16	102	175	277	138.5
34	36	222	198	420	210
35	14	148	117	265	132.5
36	31	164	197	361	180.5
37	5	82	127	209	104.5

Softball Skill Self-esteem Data, continued

Subject	Rank Order	Pre-season Score D^2	Post-season Score D^2	Total	$\bar{X}\leq D^2 =$ SSS-E*
38	29	238	118	356	178
39	40	370	124	494	247
40	42	223	300	523	261.5
41	27	157	181	338	169
42	18	171	116	287	143.5
43	47	338	234	572	286
44	53	446	319	765	382.5
45	34	226	172	398	199
46	13	99	150	249	124.5
47	43	339	188	527	263.5
48	19	84	207	291	145.5
49	52	397	256	653	326.5
50	33	115	260	375	187.5
51	9	118	100	218	109
52	15	185	84	269	134.5
53	22	180	122	302	151
		9827	10063	19750	9875.0
	$\bar{X}$ scores =	185.4	189.9	372.6	186.3
	σ scores =	87.7	81.1		75.6

* SSS-E is the abbreviation for softball skill self-esteem

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table C

Softball Skill Data

Subject	Rank Order	Fielding Average	Batting Average	Softball Skill Score
1	14	.901	.318	1.219
2	12	.824	.396	1.220
3	8	.899	.343	1.242
4	1	.961	.458	1.419
5	47	.883	.167	1.000
6	2	.983	.355	1.338
7	6	.927	.321	1.248
8	49	.750	.142	.892
9	10	.948	.287	1.235
10	15	.928	.281	1.209
11	20	1.000	.179	1.179
12	42	.754	.299	1.053
13	7	.905	.339	1.244
14	37	.911	.167	1.078
15	34	.897	.190	1.087
16	39	.876	.196	1.072
17	52	.643	.189	.832

Softball Skill Data, continued

Subject	Rank Order	Fielding Average	Batting Average	Softball Skill Score
18	19	.974	.211	1.185
19	46	.856	.157	1.013
20	38	.936	.139	1.075
21	40	.782	.279	1.061
22	26	.936	.211	1.147
23	33	.864	.225	1.089
24	41	.831	.225	1.056
25	21	.866	.303	1.169
26	36	.875	.208	1.083
27	53	.750	0	.750
28	17	.936	.260	1.196
29	18	.902	.290	1.192
30	27	.798	.333	1.131
31	9	1.000	.238	1.238
32	16	.904	.305	1.209
33	29	.917	.194	1.111
34	23	.895	.268	1.163
35	24	.959	.203	1.162
36	25	.836	.318	1.154
37	11	.952	.271	1.223
38	48	.802	.173	.976

Softball Skill Data, continued

Subject	Rank Order	Fielding Average	Batting Average	Softball Skill Score
39	32	.875	.227	1.102
40	51	.750	.125	.875
41	13	1.000	.220	1.220
42	35	.851	.233	1.084
43	4	.950	.331	1.281
44	50	.793	.097	.809
45	5	.945	.312	1.257
46	28	.884	.236	1.120
47	44	.831	.193	1.024
48	30	.814	.295	1.109
49	31	.938	.167	1.105
50	45	.825	.192	1.017
51	43	.911	.114	1.025
52	22	1.000	.167	1.167
53	3	.971	.345	1.315
		46.899	12.692	59.541
	$\bar{X}$ scores =	.885	.240	1.123
	σ scores =	.072	.084	.129

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table D

Rank Order of Softball Skill Self-esteem and Softball Skill Data

SSS-E* X	Skill Y	Rank X	Rank Y	$\frac{D}{X-Y}$	$\frac{D^2}{X-Y}$
218.0	1.078	37.0	37.0	0.0	0.00
274.0	1.087	46.0	34.0	12.0	144.00
109.0	1.072	8.5	39.0	-30.5	930.25
267.0	.832	44.0	52.0	-08.0	64.00
231.0	1.185	39.0	19.0	20.0	400.00
220.0	1.013	38.0	46.0	-08.0	64.00
205.0	1.075	34.0	38.0	-04.0	16.00
83.0	1.061	4.0	40.0	-36.0	1296.00
164.0	1.147	25.0	26.0	-01.0	1.00
70.5	1.089	1.0	33.0	-32.0	1024.00
148.0	1.056	21.0	41.0	-20.0	400.00
163.0	1.219	24.0	14.0	10.0	100.00
120.5	1.220	11.0	12.5	-01.5	2.25
140.5	1.242	17.0	8.0	9.0	81.00
110.0	1.419	10.0	1.0	9.0	81.00
167.0	1.000	26.0	47.0	-21.0	441.00
80.5	1.338	3.0	2.0	1.0	1.00

Rank Order of Softball Skill Self-esteem and Softball Skill Data, continued

SSS-E* X	Skill Y	Rank X	Rank Y	D X-Y	D^2 X-Y
147.0	1.248	20.0	6.0	14.0	196.00
170.5	.892	28.0	49.0	-21.0	441.00
254.5	1.235	41.0	10.0	31.0	961.00
212.0	1.209	36.0	15.5	20.5	420.25
178.5	1.179	30.0	20.0	10.0	100.00
123.0	1.053	12.0	42.0	-30.0	900.00
108.5	1.244	7.0	7.0	0.0	0.00
286.0	1.281	47.0	4.0	43.0	1849.00
381.0	.890	53.0	50.0	3.0	9.00
199.0	1.257	33.0	5.0	28.0	784.00
124.5	1.120	13.0	28.0	-15.0	225.00
263.5	1.024	43.0	44.0	-01.0	1.00
145.5	1.109	19.0	30.0	-11.0	121.00
327.0	1.105	51.0	31.0	20.0	400.00
187.5	1.017	32.0	45.0	-13.0	169.00
109.0	1.025	8.5	43.0	-34.5	1190.25
134.5	1.167	15.0	22.0	-07.0	49.00
151.0	1.315	22.0	3.0	19.0	361.00
247.0	1.102	40.0	32.0	8.0	64.00
261.5	.875	42.0	51.0	-09.0	81.00
169.0	1.220	27.0	12.5	14.5	210.25

Rank Order of Softball Skill Self-esteem and Softball Skill Data, continued

SSS-E* X	Skill Y	Rank X	Rank Y	D X-Y	D^2 X-Y
143.5	1.084	18.0	35.0	-17.0	289.00
79.5	1.169	2.0	21.0	-19.0	361.00
304.0	1.083	48.0	36.0	12.0	144.00
305.0	.750	49.0	53.0	-04.0	16.00
272.0	1.196	45.0	17.0	28.0	784.00
106.0	1.192	6.0	18.0	-12.0	144.00
332.0	1.131	52.0	27.0	25.0	625.00
325.0	1.238	50.0	9.0	41.0	1681.00
162.0	1.209	23.0	15.5	7.5	56.25
138.5	1.111	16.0	29.0	-13.0	169.00
210.0	1.163	35.0	23.0	12.0	144.00
132.5	1.162	14.0	24.0	-10.0	100.00
180.5	1.154	31.0	25.0	6.0	36.00
104.5	1.223	5.0	11.0	-06.0	36.00
179.0	.976	26.0	48.0	-19.0	361.00
				ΣD^2 =	18523.50

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table E

Pre-season and Post-season Softball Skill Self-esteem Data

Pre-season X_1	Post-season X_2	D	D^2
100	226	-126	15876
98	143	- 45	2025
93	188	- 95	9025
124	96	28	784
178	156	22	484
73	88	- 15	225
136	158	- 22	484
231	110	121	14641
221	288	- 67	4489
224	200	24	576
209	148	61	3721
122	124	- 2	4
89	128	- 39	1521
228	208	20	400
188	360	-172	29584
115	103	12	144
312	222	90	8100

Pre-season and Post-season Softball Skill Self-esteem Data, continued

Pre-season X_1	Post-season X_2	D	D^2
188	174	14	196
138	302	-164	26896
171	239	- 68	4624
68	98	- 30	900
129	199	- 70	4900
71	70	1	1
140	156	- 16	256
90	69	21	441
242	366	-124	15376
274	336	- 62	3844
140	404	-264	69696
80	132	- 52	2704
361	303	58	3364
264	386	-122	14884
186	138	48	2304
102	175	- 73	5329
222	198	24	576
148	117	31	961
164	197	- 33	1089
82	127	- 45	2025
238	118	120	14400

Pre-season and Post-season Softball Skill Self-esteem Data, continued

Pre-season X_1	Post-season X_2	D	D^2
370	124	246	60516
223	300	- 77	5929
157	181	- 24	576
171	116	55	3025
338	234	104	10816
446	319	127	16129
226	172	54	2916
99	150	- 51	2601
339	188	151	22801
84	207	-123	15129
397	256	141	19881
115	260	-145	21025
118	100	18	324
185	84	101	10201
180	122	58	3364
9687	10063	-376	462082
ΣX_1	ΣX_2	ΣD	ΣD^2
$\bar{X}$ = 182.8	189.9	-7.1	

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table F

Beginner and Experienced Players' Softball Skill Self-esteem Data

Beginner X_1	Beginner X_1^2	Experienced X_2	Experienced X_2^2
167.0	27889.00	163.0	26569.00
218.0	47524.00	120.5	14400.00
267.0	71289.00	140.5	19740.25
220.0	48400.00	110.0	12100.00
83.0	6889.00	80.5	6480.25
164.0	26896.00	147.00	21609.00
70.5	4970.25	170.5	29070.25
304.0	92416.00	254.5	64770.25
305.0	93025.00	212.0	44944.00
325.0	105625.00	178.5	31862.25
261.5	68382.25	123.0	15129.00
169.0	28561.00	108.5	11772.25
286.0	81796.00	274.0	75076.00
381.0	145161.00	109.0	11881.00
124.5	15500.25	181.0	32761.00
327.0	106929.00	205.0	42025.00

Beginner and Experienced Players' Softball Skill Self-esteem Data, continued

Beginner X_1	Beginner X_1^2	Experienced X_2	Experienced X_2^2
187.5	35156.25	148.0	21904.00
3860.0	1006409.00	79.5	6300.25
ΣX_1	ΣX_1^2	272.0	73984.00
$\bar{X}$ = 227.06	$\bar{X}$ = 59200.53	106.0	11236.00
N = 17		332.0	110224.00
σX_1 = 90.13		162.0	26244.00
		138.5	19182.25
		210.0	44100.00
		132.5	17556.25
		180.5	32580.25
		104.5	10920.25
		178.0	31684.00
		247.0	61009.00
		143.5	20592.25
		199.0	39601.00
		263.5	69432.25
		145.5	21170.25
		109.0	11881.00
		134.5	18090.25

Beginner and Experienced Players' Softball Skill Self-esteem Data, continued

Beginner X_1	Beginner X_1^2	Experienced X_2	Experienced X_2^2
		151.0	22801.00
		6013.5	1130701.75
		ΣX_2	ΣX_2^2
		$\bar{X} = 167.04$	$\bar{X} = 31408.38$
		$N = 36$	
		$\sigma X_2 = 60.05$	

APPENDIX L

Supplementary Tables Pertinent to the Q-sort and Data Analysis

Table G

Data Pertaining to the Softball Skill Self-esteem of Infielders and Outfielders

Infield X_1	Infield X_1^2	Outfield X_2	Outfield X_2^2
163.0	26569.00	120.5	14520.25
167.0	27889.00	140.5	19740.25
170.5	29070.25	110.0	12100.00
254.5	64770.25	80.5	6480.25
212.0	44944.00	147.0	21609.00
123.0	15129.00	109.0	11881.00
108.5	11772.25	267.0	71289.00
218.0	47524.00	181.0	32761.00
274.0	75076.00	205.0	42025.00
220.0	48400.00	325.0	105625.00
83.0	6889.00	162.0	26244.00
164.0	26896.00	138.5	19182.25
70.5	4970.25	180.5	32580.25
148.0	21904.00	104.5	10920.25
79.5	6320.25	169.0	28561.00
304.0	92416.00	143.5	20592.25

Data Pertaining to the Softball Skill Self-esteem of Infielders and Outfielders, continued

Infield X_1	Infield X_1^2	Outfield X_2	Outfield X_2^2
305.0	93025.00	286.0	81796.00
272.0	73984.00	145.5	21170.25
106.0	11236.00	327.0	106929.00
332.0	110224.00	187.5	35156.25
210.0	44100.00	178.5	31862.25
132.5	17556.25		
178.0	31684.00		
247.0	61009.00		
261.5	68382.25		
381.0	145161.00		
199.0	39601.00		
124.5	15500.25		
263.5	69432.25		
109.0	11881.00		
134.5	18090.25		
151.0	22801.00		
6166.0	1384206.50	3708.0	753024.50
ΣX_1	ΣX_1^2	ΣX_2	ΣX_2^2
$\bar{X}$ = 192.69	$\bar{X}$ = 43256.45	$\bar{X}$ = 176.57	$\bar{X}$ = 35858.31
N = 32		N = 21	
σX_1 = 79.53		σX_2 = 70.12	

APPENDIX M

Supplementary Materials Pertinent to the Analysis of Data

Formula:

$$\text{Rho} = 1 - \frac{6\Sigma D^2}{N(N^2-1)}$$

$\Sigma D^2 = 18523.5$

$N = 53$

Step 1:

$$\text{Rho} = 1 - \frac{6(18523.5)}{53\ (2809-1)}$$

$53 \times 53 = 2809 = N^2$

Step 2:

$$\text{Rho} = 1 - \frac{111141}{148824}$$

$18523.5 \times 6 = 111141.0$

$2808 \times 53 = 148824$

Step 3:

$\text{Rho} = 1 - .7467948$

Step 4:

$\text{Rho} = .2532052$

Figure 1

Computation of Rho for Question 3:

The Relationship Between Softball Skill Self-esteem and Softball Skill

APPENDIX M

Supplementary Materials Pertinent to the Analysis of Data

Formula for t-test for large paired groups:

$$t = \frac{\bar{X}_D}{\sigma \bar{X}_D} \quad : \sigma \bar{X}_D = \sqrt{\frac{\Sigma d^2}{N(N-1)}} \quad : \Sigma d^2 = \Sigma D^2 - \frac{(\Sigma D)^2}{N}$$

Step 1:

$$\Sigma d^2 = 462082 - \frac{(-367)^2}{53} \qquad \Sigma d^2 = 462082 - \frac{141376}{53}$$

$$\Sigma d^2 = 462082 - 2667.47 \qquad \Sigma d^2 = 459414.5$$

Step 2:

$$\sigma \bar{X}_D = \sqrt{\frac{459414.5}{53(52)}} \qquad \sigma \bar{X}_D = \sqrt{\frac{459414.5}{2756}}$$

$$\sigma \bar{X}_D = \sqrt{166.696} \qquad \sigma \bar{X}_D = 12.9$$

Step 3:

$$t = \frac{-7.09}{12.9} \qquad t = -.5496$$

Figure 2

Computation of t for Question 4

The Relationship Between Pre-season and Post-season Softball Skill Self-esteem

APPENDIX M

Supplementary Materials Pertinent to the Analysis of Data

Formula for t test for small uncorrelated data:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{N_1\sigma_1^2 + N_2\sigma_2^2}{N_1 + N_2 - 2}\right)\left(\frac{N_1 + N_2}{N_1N_2}\right)}}$$

$$\sigma = \sqrt{\frac{N\Sigma X^2 - (\Sigma X)^2}{N(N-1)}}$$

$$\Sigma x^2 = \Sigma X^2 - \frac{(\Sigma X)^2}{N}$$

Step 1:

$$t = \frac{227.06 - 167.042}{\sqrt{\left(\frac{(17)\ (90.13)^2 + (36)\ (60.05)^2}{17 + 36 - 2}\right)\left(\frac{17 + 36}{(17)\ (36)}\right)}}$$

Step 2:

$$t = \frac{60.018}{\sqrt{\left(\frac{(17)\ (8123.42) + (36)\ (3606.0)}{51}\right)\left(\frac{53}{612}\right)}}$$

Step 3:

$$t = \frac{60.018}{\sqrt{(5253.22)\ (.0866)}} \qquad t = \frac{60.018}{\sqrt{454.928}} \qquad t = \frac{60.018}{21.329}$$

$$t = 2.814$$

Figure 3

Computation of t for Question 5:

The Relationship Between Softball Skill Self-esteem of Beginners and that of Experienced Players

APPENDIX M

Supplementary Materials Pertinent to the Analysis of Data

Formula for t test for small uncorrelated data:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{N_1\sigma_1^2 + N_2\sigma_2^2}{N_1 + N_2 - 2}\right)\left(\frac{N_1 + N_2}{N_1 N_2}\right)}}$$

$$\sigma = \frac{N\Sigma X^2 - (\Sigma X)^2}{N\,(N-1)}$$

$$\Sigma x^2 = \Sigma X^2 - \frac{(\Sigma X)^2}{N}$$

Step 1:

$$t = \frac{192.69 - 176.571}{\sqrt{\left(\frac{(32)\,(6325.02) + (21)\,(4916.81)}{32 + 21 - 2}\right)\left(\frac{32 + 21}{(32)\,(21)}\right)}}$$

Step 2:

$$t = \frac{16.12}{\sqrt{\left(\frac{202400.64 + 103253.01}{51}\right)\left(\frac{53}{672}\right)}}$$

Step 3:

$$t = \frac{16.12}{\sqrt{(5993.21)\,(.07887)}} \qquad t = \frac{16.12}{21.7412} \qquad t = .74145$$

Figure 4

Computation of t for Question 6:
The Relationship Between Softball Skill Self-esteem of Infielders
and that of Outfielders